

## ABSTRACT OF THE DISCLOSURE

The present invention relates to a non-linear characteristic reproducing apparatus wherein a non-linear transformation processing is applied to a state quantity to be outputted. A non-linear behavior of products and parts is reproduced through modeling.

[Solving means] there are provided a non-linear characteristic reproducing unit for receiving an estimated observation quantity at the subsequent sampling time of an input state quantity and determining a normalized estimated value in which an estimated value is normalized by an estimated observation quantity at the subsequent sampling time, and a state quantity transformation unit for transforming the input state quantity at the subsequent sampling time to the output state quantity at the subsequent sampling time in accordance with a non-linear operation based on the a normalized estimated value determined in the non-linear characteristic reproducing unit.